WHAT IS CLAIMED IS:

1.   A music structure detection apparatus detecting a
structure of a music piece in accordance with chord
progression music data representing chronological changes in
chords in the music piece, comprising:

a partial music data producing device which produces
partial music data pieces each including a predetermined
number of consecutive chords starting from a position of
each chord in said chord progression music data;

a comparator which compares each of said partial music
data pieces with said chord progression music data from each
of the starting chord positions in said chord progression
music data, on the basis of an amount of change in a root of
a chord in each chord transition and an attribute of the
chord after the transition, thereby calculating degrees of
similarity for each of said partial music data pieces;

a chord position detector which detects a position of a
chord in said chord progression music data where the
calculated similarity degree indicates a peak value higher
than a predetermined value for each of said partial music
data pieces; and

an output device which calculates the number of times
that the calculated similarity degree indicates a peak value
higher than said predetermined value for all said partial
music data pieces for each chord position in said chord
progression music data, thereby producing a detection output
representing the structure of the music piece in accordance

-35-

with the calculated number of times for each chord position.

2.   The music structure detection apparatus according to claim 1, wherein

said comparator compares each of said partial music data pieces with said chord progression music data in the basis of the amount of change in the root of a chord in a chord transition from each chord position in said chord progression music data, the attribute of the chord after the transition and a ratio of time lengths of the chord before and after the transition, so as to calculate the similarity degrees for each of said partial music data pieces.

3.   The music structure detection apparatus according to claim 1, wherein

said comparator compares each of said partial music data pieces with said chord progression music data by temporally jumping back and forth.

4.   The music structure detection apparatus according to claim 1, wherein

when a chord after a transition represented by each of said partial music data pieces and a chord after a transition represented by said chord progression music data have a related key, said comparator regards these chords after the transitions as the same chord.

5.   The music structure detection apparatus according to claim 1, wherein

each of said partial music data pieces and said chord progression music data each have two chords as first and

second chord candidates for each chord transition point, and

said comparator mutually compares the first and second chord candidates of each of said partial music data pieces and the first and second chord candidates of said chord progression music data.

6. The music structure detection apparatus according to claim 5, further comprising:

a frequency converter which converts an input audio signal representing a music piece into a frequency signal representing a level of a frequency component at predetermined time intervals;

a component extractor which extracts a frequency component corresponding to each tempered tone from the frequency signal obtained by said frequency converter at said predetermined time intervals;

a chord candidate detector which detects two chords each formed by a set of three frequency components as said first and second chord candidates, said three frequency components having a large total level of the frequency components corresponding to the tones extracted by said component extractor; and

a smoothing device which smooths trains of said first and second chord candidates repeatedly detected by said chord candidate detector to produce said chord progression music data.

7. The music structure detection apparatus according to claim 1, wherein

said comparator adds temporary data indicating only said predetermined number of temporary chords to the end of said chord progression music data so as to compare with each of said partial music data pieces.

8. The music structure detection apparatus according to claim 1, wherein

said output device reproduces music sound of a part calculated the largest number of times for each chord position in said chord progression music data to output the music sound.

9. A method of detecting a structure of a music piece in accordance with chord progression music data representing chronological changes in chords in the music piece, said method comprising the steps of:

producing partial music data pieces each including a predetermined number of consecutive chords starting from a position of each chord in said chord progression music data;

comparing each of said partial music data pieces with said chord progression music data from each of the starting chord positions in said chord progression music data, on the basis of an amount of change in a root of a chord in each chord transition and an attribute of the chord after the transition, thereby calculating degrees of similarity for each of said partial music data pieces;

detecting a position of a chord in said chord progression music data where the calculated similarity degree indicates a peak value higher than a predetermined

value for each of said partial music data pieces; and

calculating the number of times that the calculated similarity degree indicates a peak value higher than said predetermined value for all said partial music data pieces for each chord position in said chord progression music data, thereby producing a detection output representing the structure of the music piece in accordance with the calculated number of times for each chord position.

10. A computer program product comprising a program for detecting a structure of a music piece, said detecting comprising the steps of:

producing partial music data pieces each including a predetermined number of consecutive chords starting from a position of each chord in said chord progression music data;

comparing each of said partial music data pieces with and said chord progression music data from each of the starting chord positions in said chord progression music data, on the basis of an amount of change in a root of a chord in each chord transition and an attribute of the chord after the transition, thereby calculating degrees of similarity for each of said partial music data pieces;

detecting a position of a chord in said chord progression music data where the calculated similarity degree indicates a peak value higher than a predetermined value for each of said partial music data pieces; and

calculating the number of times that the calculated similarity degree indicates a peak value higher than said

-39-

predetermined value for all said partial music data pieces

for each chord position in said chord progression music

data, thereby producing a detection output representing the

structure of the music piece in accordance with the

calculated number of times for each chord position.